

SUMMARY
BIOLOGICAL OPINION ON CONSTRUCTION OF NEW SOLOMON BRIDGE
AND INTERIM REPAIRS OF OLD SOLOMON BRIDGE

Date of the opinion/report: May 19, 1995

Action agency: Federal Highway Administration

Project: Construction of new Solomon Bridge and interim repairs of old Solomon Bridge

Listed species and critical habitats: Razorback sucker with critical habitat,
southwestern willow flycatcher, cactus ferruginous pygmy-owl

Biological opinion: Proposed action is not likely to jeopardize the continued
existence of the razorback sucker or destroy or adversely modify its critical habitat.

Conditional concurrence with finding that the project is not likely to adversely affect the
southwestern willow flycatcher or cactus ferruginous pygmy-owl pending pre-construction
surveys.

Incidental take statement

Level of take anticipated: The Service anticipates take of one razorback sucker may be
taken.

Reasonable and prudent measures and terms and conditions:

Reasonable and prudent measures:

1. All commitments included under "Mitigation" in the biological assessment for the proposed project (for both the new bridge and repairs to the existing, as appropriate) will be implemented as described. These commitments represent the types of actions that would have been required by the Service had they not already been in the project description.
2. Measures to limit sediment transport to the river will be included in the construction plans
3. An evaluation of the extent of channel changes resulting from the constriction by the new bridge will be completed to assist in assessing problems that may be created during future high flow conditions.

Terms and Conditions to implement reasonable and prudent measures:

- 1.a. All mitigation commitments in the biological assessment will be agreed to and implemented by the action agency, other funding agencies, and the applicant as appropriate.
- 1.b. These commitments will be implemented during the appropriate phases of the project.
- 2.a. Construction activities in the river bed will be confined to the smallest area practicable.
- 2.b. Methods to reduce sediment input (including but not limited to sediment fences) from the disturbed areas under the bridge, diversions berms, and in the pilot channel, will be investigated and those practicable will be implemented.
- 3.a. A hydrologic report of potential effects of the bridge placement on existing channel conditions in the vicinity of the site will be made to document the types of changes that may be expected to occur. HEC modeling should be used in the report.
- 3.b. The evaluation should at a minimum include a survey of existing channel conditions, an examination of potential changes in the velocity profile, and a review of the hydrograph at the five-year, 10-year, 50-year, and 100-year floods, in order to determine impacts of bridge construction on channel morphology and related losses of riparian habitat.

Conservation recommendations:

- 1. Provide financial assistance to the Arizona Partners in Flight willow flycatcher survey effort, sponsored by the Arizona Game and Fish Department, to help determine the effects of bridge and road-related projects on the fragmentation of riparian habitats and nesting success of the willow flycatcher.
- 2. Modify the proposed bridge to not restrict the width of the Gila River channel.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.



UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
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Telephone: (602) 640-2720 FAX: (602) 640-2730
May 19, 1995

In Reply Refer To:
2-21-94-F-179

Mr. Kenneth H. Davis
District Engineer
Federal Highway Administration
234 N. Central Avenue Suite 330
Phoenix, Arizona 85004

Dear Mr. Davis:

The U.S. Fish and Wildlife Service (Service) has reviewed the project plans for the construction of a new Solomon Bridge and interim repairs to the existing crossing over the Gila River at the Sanchez Road crossing in the Safford Valley, Graham County, Arizona. Your February 9, 1995 request for formal consultation was received on February 13, 1995. This document represents the Service's biological opinion on the effects of that action on the endangered razorback sucker (Xyrauchen texanus) and concurrence with not likely to adversely affect findings for the endangered southwestern willow flycatcher (Empidonax traillii extimus) and the proposed endangered cactus ferruginous pygmy-owl (Glaucidium brasilianum cactorum). The Gila River in the proposed project area has been designated as critical habitat for the razorback sucker. This document is written in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

This biological opinion is based on information provided in the biological assessment dated February 21, 1995 and in previous versions of that document, meetings with project proponents and other sources of information. A complete administrative record of this consultation is on file in this office.

The Service concurs with the biological assessment findings that the project is not likely to adversely affect the endangered southwestern willow flycatcher or the proposed endangered cactus ferruginous pygmy-owl subject to the following conditions:

- A survey for willow flycatchers within the action area is conducted prior to construction, following guidelines established in *A Survey Protocol for the Southwestern Willow Flycatcher*, by Tibbitts, et al. (1994), ensuring no flycatchers are present. Should any willow flycatchers be identified in the action area, construction will not commence until

the Service has been contacted. The Service should be contacted within 72 hours of identification of willow flycatchers within the proposed project area. Finding this species would trigger reinitiation of consultation.

- A survey for pygmy-owls within the action area is conducted prior to construction, following guidelines established by the Arizona Game and Fish Department, ensuring no pygmy-owls are present. Should any pygmy-owls be identified in the proposed project area, construction will not commence until the Service has been contacted. The Service must be contacted within 72 hours of identification of a pygmy-owl within the proposed project area. Finding this species would trigger re-initiation of consultation.

Consultation History

Consultants for the project requested a species list for the project area on February 1, 1994. The list was provided on March 1, 1994 and contained three listed species; the razorback sucker, peregrine falcon (Falco peregrinus anatum) and bald eagle (Haliaeetus leucocephalus). The list also included the proposed endangered southwestern willow flycatcher. At the time this list was developed, critical habitat for the razorback sucker was only proposed. Notice was given to the contractors on April 15, 1994 of the final rule designating critical habitat.

The Service received a biological assessment dated September 1, 1994 which concluded there would be no effect to listed or proposed species or designated critical habitat. The Service did not concur with this finding in a letter back to the consultants dated September 13, 1994. Another biological assessment was prepared by the consultants and was discussed at a meeting held January 26, 1995. The Service requested supplemental information which was received February 21, 1995.

The original request for formal consultation was for the razorback sucker and its designated critical habitat only. Subsequently, formal consultation was requested for the southwestern willow flycatcher in a letter dated March 3, 1995 that was received by the Service on March 6, 1995. By this letter the Service finds formal consultation on that species unnecessary at this time.

The original request for consultation only dealt with the construction of the new Solomon bridge. On May 3, 1995, the Service received a letter dated May 1, 1995 from the Federal Highway Administration (FHWA) requesting that the repair work on the old bridge crossing be incorporated into the consultation. The Service has accommodated this request.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The Project

The proposed action has two distinct parts: construction of a new bridge and interim repairs of the existing (old) bridge.

New Bridge

The new bridge would span approximately 800 feet over the Gila River at Sanchez Road, north of the town of Solomon in Graham County, Arizona. This structure would replace the existing 88 foot long bridge. Repairs to the existing bridge to make it usable until the new structure is complete constitute the second part of the action. The approaches to the existing bridge are often rendered unusable by high flows in the Gila River, disrupting travel in the area. The new bridge would be designed to accommodate higher flow events than the existing, but extreme high flows could still result in bridge closures due to washouts and other damage to the approaches and other portions of the bridge.

The project under consultation does not include any work to remove the existing crossing after the new bridge is complete. It also does not cover any repairs to the new bridge that may be needed after high water events.

The preferred alternative for the new bridge, Alternative E, would be an approximately 800 foot long concrete span. The approaches to the bridge would total 820 feet long with a width of 120 feet. Up to 25 vertical feet of fill would be necessary to create the approaches. The approaches would connect to the existing road north and south of the river channel. Rip-rap armored spur dikes would be placed to protect the approaches and the abutments. There would be five sets of piers on 135 foot centers in the river channel to support the bridge deck. Fill material would be obtained from sources above the normal high-water line.

Construction would take place in five phases. A pilot channel would be created at the location of the old "low flow" channel under the existing bridge to relocate the river away from the south bank. A smaller version of this channel is part of the repair project. Placement of the piers and abutments would comprise the second phase, with the approaches and spur dikes the third phase. Placement of the horizontals on the piers would be in the fourth phase. This would be the last phase in which construction would have to take place from the river channel. A temporary access road would be constructed adjacent to the work site. No equipment would be stored in the channel and all excess materials will be removed at the completion of the project.

Construction of the new bridge would result in the disturbance of approximately 7.40 acres of which 3.58 acres would be the approaches, 3.10 acres the pilot channel, and 0.69 acres for the spur dikes. Riparian vegetation would be destroyed along a 480 foot reach during the creation of the north approach road.

Repairs to the existing (old) bridge

Repairs to the existing (old) bridge have been needed in the past, and the County or other affected parties have repaired the crossing as necessary. The types of work required for the normal repairs have been consistent over time. The same protocol would be used to repair the crossing until the new bridge is complete. This involves the construction of a pilot channel to re-direct the Gila River under the 88-foot bridge, reconstruction of a diversion dike at the upstream end of the channel to force the water into the channel, and the reconstruction of the approach roads if necessary. Culverts are placed in the approach road to pass small flows. All work takes place in the river channel or on the road itself and no riparian vegetation is expected to be affected.

Project mitigation features

The project also includes some commitments to reduce the effects of the project to the razorback sucker and its designated critical habitat. A construction plan would be developed by Graham County (the project proponent) to minimize disturbance to aquatic and riparian habitats in the Gila River. This plan would also contain a riparian restoration plan that would begin prior to actual construction. Photographic records of the project area would be taken yearly for five years.

Prior to any construction work that would affect live water, a qualified fishery biologist would survey the site for razorback suckers. The survey would include visual examination, netting and, if possible, electroshocking of all potential habitat. In the event of a surface flow event after this survey, all construction activities in the channel would be terminated until additional surveys can be completed. Construction in the channel would not occur during surface flow events. When areas of surface water must be disturbed, the construction plan would provide measures to minimize the area to be disturbed.

If surveys do locate a razorback sucker, the individual would be relocated out of the construction area and more intensive surveys would be done within the construction area to ensure there are no additional individuals. Construction would be halted until the fish are relocated. The Service would be notified within 72 hours of all captures.

To ensure compliance with the construction mitigation plan, construction crews in the field would be informed of the restrictions and crew supervisors would enforce the restrictions.

Additional information on the construction of this proposed action is available in the biological assessment.

The Project Area

The Gila River in the project vicinity occupies a channel approximately 1600 feet wide. Although there are several agricultural diversions upstream of the bridge site, there are no storage reservoirs or significant flood control works. As a result, flows in the river vary seasonally from very low to very high. Even during periods of significant irrigation diversion, if there are sufficient rains in the upper watershed, flows can be quite substantial. The river may fill the existing channel during high water events and areas of erosion and aggradation along banks and within the river channel are easily recognized. When flows recede, the river often stabilizes in a different location within the channel. Availability of specific aquatic habitats (i.e. pools, runs, riffles) varies in the project area based on present flows and changes to channel configuration due to past flow events. There are areas where various types of bank stabilization has been attempted. Rip-rap, car bodies/railroad cars, and Kellner jacks with and without riparian plantings have been used in the area to try and prevent bank erosion during high flow events.

The project area borders agricultural fields on both sides of the river. Within the channel are extensive areas of sand and gravel bars with scattered patches of vegetation. Cottonwood (Populus sp.), willows (Salix sp.), and other typical riparian plant species are present.

STATUS OF THE SPECIES:

Background Information

A. Species description

The razorback sucker is an endemic fish species of the Colorado River basin. The first records of the species are from the lower Gila River above Yuma (Bartlett 1854), the mainstem Colorado River (Abbott 1861) and near the Gila-Colorado River confluence (Lockington 1881). These early records assigned the razorback sucker to the genus Catostomus, the genus name for several species of endemic Colorado River basin suckers. The present, monotypic genus for the razorback sucker, Xyrauchen, was erected in 1889 (Kirsch 1889) based on specimens taken from the Gila River near Ft. Thomas. This taxonomy is still the standard accepted today.

The razorback sucker was proposed for listing as a threatened species on April 24, 1978 (43 FR 17375). The proposal was withdrawn on procedural grounds (the Service had not completed the listing within two years as required by the 1978 amendments to the Act) on May 27, 1980. The Service was petitioned to list the razorback sucker as an endangered species on March 15, 1989 by a coalition of environmental groups led by the Sierra Club. The Service made a positive finding on the petition that was published in the Federal Register on August 15, 1989 (54 FR 33586). The proposed rule was published in the

Federal Register on May 22, 1990 and a final rule designating the species as endangered was published on October 23, 1991 (54 FR 54957) and took effect on November 22, 1991. This final rule stated that critical habitat could not be determined at the time of listing.

The Service received a notice of intent to sue on the failure to designate critical habitat on October 31, 1991 from the Sierra Club Legal Defense Fund. A lawsuit was filed by the Sierra Club on May 7, 1992. On October 27, 1992, the Court found that the Service had violated the Act by not designating critical habitat and ordered the Service to publish a proposed rule within 90-days. The proposed rule was published in the Federal Register on January 29, 1993 (58 FR 6578). The public comment period was reopened on September 15, 1993 to allow comment on the economic analysis and biological support documents. The final rule designating critical habitat was published on March 21, 1994 (59 FR 13374) and took effect on April 20, 1994. The Gila River from the Arizona-New Mexico border to Coolidge Dam was designated as critical habitat.

Natural populations of razorback sucker currently exist in several small reaches of the Colorado River or its tributaries in Colorado, New Mexico, and Utah. In Arizona, natural populations exist in the Grand Canyon/Lake Mead area, Lake Mohave, Lake Havasu, and the Colorado River below Parker Dam. Only the Lake Mohave population is of any significant size. Introductions of razorback sucker into the Gila, Salt and Verde Rivers in Arizona have not succeeded in establishing large populations in those rivers.

B. Life history

Habitat requirements of the razorback sucker for all life stages are not well known. There are few large, extant, riverine populations remaining and studies on reservoir populations are logistically difficult. Radio and sonic tagging experiments are ongoing and will provide information on habitat use. A summary of published and unpublished information on the life history of the razorback sucker is available in the biological support document prepared for the designation of critical habitat (USFWS 1993). Please refer to that document for information on life history.

C. Population dynamics

Population size: The largest remaining population of razorback suckers is in Lake Mohave on the Colorado River below Hoover Dam. In 1994 this population was estimated at 25,000 individuals, however, this figure may be misleading in a cursory evaluation, since the population is composed of old adults nearing senescence, not a population with a strong component of young adult fish. As a result, this population continues in a significant decline. Much smaller natural populations are known from the Grand Canyon and Lake Mead, Lake Havasu, and the lower Colorado River below Parker Dam. Old adults largely dominate these smaller populations. As noted earlier, reintroductions into the Gila, Salt and Verde Rivers have not created large populations in those systems. Efforts to replace the aging Colorado River populations in Lakes Mohave, Havasu and the lower river are

ongoing, however relatively few fish have been released to date. Restoration efforts in the upper Colorado River basin have only begun and natural populations there continue to decline.

Population stability: The razorback sucker populations are not stable. Lack of successful recruitment has skewed the normal age distribution of the populations to domination by old, senescent, adults. All natural populations are declining as these fish die off. The long life span of the species has enabled populations to persist without recruitment, however, this is not a situation that can continue without causing the extirpation or extinction of the species.

D. Status and distribution

Reasons for listing: The razorback sucker was listed as an endangered species in response to large declines in both population size and amount of historic range occupied. Critical habitat was designated in most occupied habitats to provide additional protection for these habitats when the likelihood of an individual fish being in the particular area of a proposed action was low due to the small size of most populations.

Rangewide trend: The razorback sucker continues to decline throughout its range. Restoration efforts are not yet equal to the task of maintaining current population levels.

New threats: Additional habitat losses will likely be on the small project scale and be of the same types as known to date. Introductions of additional non-native species that may have adverse effects to razorback suckers could occur. For both of these threats, there are existing regulatory processes that provide some oversight review.

E. Species' response to a proposed action

Numbers of individuals/populations in the action area affected: The population of razorback suckers in the Gila River is very small. The number of fish that might be in the area of the action is not known. That portion of the project area in the 100-year floodplain is in designated critical habitat. Effects of the action may be more directed to effects on critical habitat.

Sensitivity to change: Evolving in the dynamic, highly variable aquatic habitats of the Colorado River basin, the razorback sucker can likely tolerate a wide range of physical conditions. Clearly, some changes that have resulted from human development along the rivers have altered overall habitat quality. The extent to which changes to the physical habitat have contributed to the decline of the species has not been precisely determined. Some of these physical changes may, of themselves, not had a direct effect on the razorback sucker, but allowed populations of non-native competitors to flourish. There have been so many interconnecting changes to the physical habitats that determining which action or combination thereof caused which change, and what effect that particular change had on the razorback sucker, becomes a complex issue.

Resilience: The resilience of primary constituent elements in critical habitat to disturbance is more important for this population than the resilience of the individuals of the species. Upstream and in the vicinity of the proposed action, the Gila River has been modified and affected by water diversions, bank stabilization and other channel modifications, and development in the floodplain (municipal and agricultural). Use of the watershed (livestock grazing, mineral exploration, timber harvest) also affects the primary constituent elements to some degree. The extent to which the physical and biological parameters can adapt to additional changes and maintain or improve the quality of habitat is not known.

Recovery rate: The time it will take for the habitat to recover from the disturbance is not known. The immediate ground disturbance would not be expected to last beyond the next high water event, however, the constriction of the channel resulting from the new bridge may have long terms effects.

ENVIRONMENTAL BASELINE

Status of species within the action area

The razorback sucker population in the Gila River represents a very small percentage of the total population in the lower Colorado River basin. There is limited information on where members of this population may be at any time. This is due in part to the small size of the population and to the limited survey data. There is a similar lack of specific data on the habitat quality in the immediate area of the project. Habitat quality also varies by season due to the depletions that occur in the Safford valley, and by occurrences of high flows in response to storm events and subsequent flood control efforts. Changes to channel configuration, presence of pools and other features occur after each flow event.

The changes in razorback sucker recovery needs and priorities has resulted in fewer augmentations to the Gila River population than to the Salt, Verde or Colorado Rivers populations. Unless natural recruitment is occurring (which is very unlikely), this population is not expanding and may in fact be decreasing. It is expected that efforts to augment this population could be implemented in the near future as recovery operations expand.

Primary constituent elements of critical habitat for the razorback sucker are:

- Space for individual and population growth, and for normal behavior;
- Food, water, or other nutritional or physiological requirements;
- Cover or shelter;
- Sites for breeding, reproduction, rearing of offspring;
- Habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.

Additional selection criteria were developed for the razorback sucker during the designation process to assist in defining the areas to be selected. These have relevance to the discussions in this opinion and are listed below:

1. Known or suspected wild spawning populations, although recruitment may be limited or non-existent.
2. Areas where juvenile razorback suckers have been collected or which could provide suitable nursery habitat (backwaters, flooded bottomlands or coves).
3. Areas presently occupied or that were historically occupied that are considered necessary for recovery and that have the potential for establishment of razorback sucker.
4. Areas and water required to maintain rangewide fish distribution and diversity under a variety of physical, chemical, and biological conditions.
5. Areas that need special management or protection to ensure razorback survival and recovery. These areas once met the habitat needs of the razorback sucker and may be recoverable with additional protection and management.

The development along the Gila River in the Safford valley has altered the river's character, but not eliminated the constituent elements and additional selection criteria from the resultant habitats. Variation in flow regimes, sediment load, water quality and other physical factors may in some cases be within the range of historic variation of the river. It is unfortunate that more historic information on the river is not available.

Some of the development actions were Federal, others were State or private. Most, if not all of the major actions took place prior to the passage of the Act and the listing of the razorback sucker, and many did not have a Federal nexus.

EFFECTS OF THE ACTION

a. Action parameters to consider

Proximity of the action: The construction of the proposed bridge and repairs to the existing crossing would occur within critical habitat for the razorback sucker. The likelihood that an individual razorback sucker would be in the project area is not known and the risk to an individual may be low.

Distribution: The actual construction actions will take place in a contained area, however, effects to river flows would be felt both upstream and downstream for some distances. Effects caused by the repair work may not have as great a downstream effect, however, relocation of the active channel back under the existing structure may have additional hydraulic effects.

Timing: The construction of the new bridge would begin in May or June 1996 and be completed in approximately one year. The latter portion of the construction period would not require access to the river channel as all work would be done from the bridge deck. Most of the channel disturbance would be during the low flow periods in summer and early fall. There is a long term effect resulting from the construction in that the channel would be constricted to approximately 800 feet at the bridge.

The repair work could occur as needed at any time between the present and completion of the new bridge. There may be no need for the work, or it may have to be repeated several times due to repeated high water events. The only certainty is that the work would cease once the new bridge is completed.

Nature of the effect:

Direct and indirect effects: The direct effects of the action include disturbance of the channel sediments by movement of heavy equipment and excavating (for piers, spur dikes, pilot channel, diversion berm and approach roads) loss of riparian vegetation (new bridge only), and changes to channel configuration due to the constriction of the channel by the new approaches and spur dikes.

Increases in sediment load downstream of the disturbed construction area are likely until the area stabilizes. Creating the pilot channels for either the new bridge or repair of the existing crossing will contribute sediment, and any higher flows that cross the construction areas would be expected to pick up additional materials. The amount of this additional sediment load is not known, and it is not known if this would be a measurable increase in the sediment load carried by the river at various flow levels. This increase is not likely to be permanent, and may be overshadowed by later changes resulting from constriction of the river channel.

Loss of riparian vegetation affects bank stability and nutrient inflow to the aquatic habitats. Until the new plantings reach the size and condition of the existing trees that would be lost, there will be a net loss in productivity reaching the river. The extent to which this loss would affect the quality of the aquatic habitat is not known. There are areas of riparian vegetation in the overall area that would continue to contribute to the system.

Over the long term, the constriction of the river channel (from 1600 feet wide to 800 feet wide) is likely to have effects on water velocity that would affect sediment loads and channel configuration at flows that previously would have utilized a wider corridor. The armoring

of the spur dikes will contribute to the increase in velocity and decrease in bankside sediments picked up by the water. In confined situations, increases in water velocity result in scouring of the channel, deepening it to some degree. In some cases, bank armoring (in this case the rip-rap on the spur dikes) can become undermined if the scour reaches below the level of the armoring. The material picked up is deposited somewhere below the constriction, contributing to aggradation of the channel in that location. Aggradation of the channel downstream may have effects to bank erosion, channel configuration and other physical components, the extent of which is difficult to predict. It is also difficult to predict when the channel would reach the same level of stability currently present. These changes may result in additional or reduced damages to existing banks during high water events.

These effects must also be looked at in the context of the existing bridge. Channel disturbance to repair or replace the approaches to this 88 foot span occurs regularly. This work often consists of recreating the pilot channel to return the river to flow under the bridge, creation of diversion structures to keep the flow in the pilot channel and grading to restore the approaches once they have been damaged. The new project, while creating some new impacts, does eliminate the repeated need to work in the river channel after every high water event. The new bridge may require such work in the event of a larger event than the design specifications occurs.

Interrelated actions: These are part of a larger action and depend upon the larger actions for their justification. No interrelated actions have been associated with this project.

Interdependent actions: These are actions having no independent utility apart from the proposed action. No interdependent actions have been associated with this project.

Cumulative effects: Cumulative effects include the effects of future State, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

The construction of a reliable transport link across the Gila River at this location may encourage additional development to occur in the area or re-route traffic from existing crossings. The extent of this potential is not known. Agricultural use of the immediate area is not likely to change. There is local interest in replacing at least one other bridge crossing over the Gila River in the Safford valley. Some Federal involvement would likely be necessary for this project to proceed so it does not count as a cumulative effect.

CONCLUSION

After reviewing the current status of the razorback sucker, the environmental baseline for the action area, the effects of the proposed bridge, interim repairs of the old bridge, and the cumulative effects, it is the Service's biological opinion that the construction of this bridge, including repairs to the old bridge, as proposed, is not likely to jeopardize the continued existence of the razorback sucker and is not likely to destroy or adversely modify designated critical habitat for the razorback sucker.

INCIDENTAL TAKE STATEMENT

Sections 4 (d) and 9 of the Act, as amended, prohibit taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or the applicant. Under the terms of section 7(b)(4) and section 7 (o)(2), taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary, and must be implemented by the agency so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7 (o)(2) to apply. The FHWA has a continuing duty to regulate the activity covered by this incidental take statement. If the FHWA (1) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7 (o)(2) may lapse.

AMOUNT OR EXTENT OF INCIDENTAL TAKE:

The Service anticipates incidental take of the razorback sucker will be difficult to detect and quantify. The small size of the razorback sucker population in the Gila River reduces the likelihood that an individual fish would be in the project area. There is a commitment to include in the project construction plans a plan to minimize the risk of injury to individual fish that further reduces the extent of incidental take of individuals. The possibility of direct take of individuals only occurs during the construction period of the new bridge and during

the course of any repairs to the existing structure. It is anticipated that one razorback sucker may be taken by the proposed action. This take would be in the form of harassment or killing.

A certain amount of razorback sucker critical habitat would also be affected by the proposed action. The actual amount of habitat permanently removed or eliminated from use is limited to the area covered by the spur dikes, approaches, and in-channel bridge supports (refer to assessment for figures). These losses would be permanent. Alterations to existing habitats are expected to occur as a result of changes to channel configuration and elimination of riparian vegetation. There is a commitment to include in project construction plans replacement of the riparian vegetation destroyed by the project. The changes to habitat will be permanent only in the sense that the post-construction habitats would not be identical to the pre-construction conditions. It is not certain what these specific changes would be. This take would be in the form of harm or harassment.

EFFECT OF THE TAKE

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take:

1. All commitments included under "Mitigation" in the biological assessment for the proposed project (for both the new bridge and repairs to the existing, as appropriate) will be implemented as described. These commitments represent the types of actions that would have been required by the Service had they not already been in the project description.
2. Measures to limit sediment transport to the river will be included in the construction plans.
3. An evaluation of the extent of channel changes resulting from the constriction by the new bridge will be completed to assist in assessing problems that may be created during future high flow conditions.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, the FHWA must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

To implement reasonable and prudent measure 1, the following terms and conditions are necessary:

- a. All mitigation commitments in the biological assessment will be agreed to and implemented by the action agency, other funding agencies, and the applicant as appropriate.
- b. These commitments will be implemented during the appropriate phases of the project.

To implement reasonable and prudent measure 2, the following terms and conditions are necessary:

- a. Construction activities in the river bed will be confined to the smallest area practicable.
- b. Methods to reduce sediment input (including but not limited to sediment fences) from the disturbed areas under the bridge, diversions berms, and in the pilot channel, will be investigated and those practicable will be implemented.

To implement reasonable and prudent measure 3, the following terms and conditions are necessary:

- a. A hydrologic report of potential effects of the bridge placement on existing channel conditions in the vicinity of the site will be made to document the types of changes that may be expected to occur. HEC modeling should be used in the report.
- b. The evaluation should at a minimum include a survey of existing channel conditions, an examination of potential changes in the velocity profile, and a review of the hydrograph at the five-year, 10-year, 50-year, and 100-year floods, in order to determine impacts of bridge construction on channel morphology and related changes in quantity of riparian habitat.

These reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action. With implementation of these measures, the Service believes that take can be reduced to no individual razorback suckers taken and habitat disturbance minimized to the extent possible. If, during the course of the action, a dead razorback sucker is found, such take represents new information requiring review of the reasonable and prudent measures provided. The FHWA must immediately contact the Service, identifying the causes of the

taking, and reviewing with the Service, the need for reinitiation of consultation and modification of the reasonable and prudent measures.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans or to develop information. The Service has developed the following conservation recommendations for the proposed action.

- a. Provide financial assistance to the Arizona Partners in Flight willow flycatcher survey effort, sponsored by the Arizona Game and Fish Department, to help determine the effects of bridge and road-related projects on the fragmentation of riparian habitats and nesting success of the willow flycatcher.
- b. Modify the proposed bridge to not restrict the width of the Gila River channel.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION

This concludes formal consultation on the actions outlined in the request. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions concerning this biological opinion and incidental take statement, please contact Ted Cordery or Tom Gatz in our office.

Sincerely,

A handwritten signature in cursive script, appearing to read "Sam F. Spiller".

Sam F. Spiller
State Supervisor

cc: Director, Arizona Game and Fish Department, Phoenix, AZ
Regulatory Branch, U.S. Army Corps of Engineers, Phoenix, AZ
Regional Director, Fish and Wildlife Service, Albuquerque, NM (AES)
Project Coordinator, Parker Fisheries Research Office, Fish and Wildlife Service, Parker,
AZ
Project Leader, Pinetop Fisheries Assistance Office, Fish and Wildlife Service, Pinetop,
AZ

Literature Cited

- Abbott, C.C., 1861. Descriptions of four new species of North American Cyprinidae. Proceedings of the Philadelphia Academy of Natural Sciences 12(1860) 473-474.
- Bartlett, J.P., 1854. Personal narrative of exploration and incidents in Texas, New Mexico, California, Sonora, and Chihuahua, connected with the U.S. and Mexican Boundary Commission during the years 1850, '51, '52, and '53, volumes 1 and 2. New York: D. Appleton.
- Kirsch, P.H., 1889. Notes on a collection of fishes obtained in the Gila River at Fort Thomas, Arizona. Proceedings of the U.S. National Museum II, 555-558.
- Lockington, W.N., 1881. Description of a new species of *Catostomus* (*Catostomus cypho*) from the Colorado River. Proceedings of the Philadelphia Academy of Natural Sciences 32, 237-240.
- Tibbitts, T.J., M.K. Sogge, and S.J. Sferra. 1994. A Survey Protocol for the Southwestern Willow Flycatcher (*Empidonax traillii extimus*). Technical Report NPS/NAUCPRS/NRTR-94/04. National Park Service, Colorado Plateau Research Station at Northern Arizona University. Flagstaff, Arizona. 24 pp.
- U.S. Fish and Wildlife Service. 1993. Colorado River Endangered Fishes Critical Habitat, draft Biological Support Document. USFWS, Utah/Colorado Field Office, Salt Lake City, Utah.

SUMMARY
BIOLOGICAL OPINION ON CONSTRUCTION OF NEW SOLOMON BRIDGE
AND INTERIM REPAIRS OF OLD SOLOMON BRIDGE

Date of the opinion/report: May 19, 1995

Action agency: Federal Highway Administration

Project: Construction of new Solomon Bridge and interim repairs of old Solomon Bridge

Listed species and critical habitats: Razorback sucker with critical habitat,
southwestern willow flycatcher, cactus ferruginous pygmy-owl

Biological opinion: Proposed action is not likely to jeopardize the continued
existence of the razorback sucker or destroy or adversely modify its critical habitat.

Conditional concurrence with finding that the project is not likely to adversely affect the
southwestern willow flycatcher or cactus ferruginous pygmy-owl pending pre-construction
surveys.

Incidental take statement

Level of take anticipated: The Service anticipates take of one razorback sucker may be
taken.

Reasonable and prudent measures and terms and conditions:

Reasonable and prudent measures:

1. All commitments included under "Mitigation" in the biological assessment for the proposed project (for both the new bridge and repairs to the existing, as appropriate) will be implemented as described. These commitments represent the types of actions that would have been required by the Service had they not already been in the project description.
2. Measures to limit sediment transport to the river will be included in the construction plans
3. An evaluation of the extent of channel changes resulting from the constriction by the new bridge will be completed to assist in assessing problems that may be created during future high flow conditions.

Terms and Conditions to implement reasonable and prudent measures:

- 1.a. All mitigation commitments in the biological assessment will be agreed to and implemented by the action agency, other funding agencies, and the applicant as appropriate.
- 1.b. These commitments will be implemented during the appropriate phases of the project.
- 2.a. Construction activities in the river bed will be confined to the smallest area practicable.
- 2.b. Methods to reduce sediment input (including but not limited to sediment fences) from the disturbed areas under the bridge, diversions berms, and in the pilot channel, will be investigated and those practicable will be implemented.
- 3.a. A hydrologic report of potential effects of the bridge placement on existing channel conditions in the vicinity of the site will be made to document the types of changes that may be expected to occur. HEC modeling should be used in the report.
- 3.b. The evaluation should at a minimum include a survey of existing channel conditions, an examination of potential changes in the velocity profile, and a review of the hydrograph at the five-year, 10-year, 50-year, and 100-year floods, in order to determine impacts of bridge construction on channel morphology and related losses of riparian habitat.

Conservation recommendations:

- 1. Provide financial assistance to the Arizona Partners in Flight willow flycatcher survey effort, sponsored by the Arizona Game and Fish Department, to help determine the effects of bridge and road-related projects on the fragmentation of riparian habitats and nesting success of the willow flycatcher.
- 2. Modify the proposed bridge to not restrict the width of the Gila River channel.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.